Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

It is, of course, evident that such mineralogical names cannot be applied to rocks of complex composition.

It seems clear that the naming of rocks may be carried to excess, and that the science of petrography may readily be buried under its own nomenclature.

H. W. TURNER.

U. S. GEOLOGICAL SURVEY.

THE DIVERSE FLORAS OF THE ROCKY MOUNTAIN REGION.

FEW persons living in the Eastern States are aware of the greatly diversified country which is included under the general title of the Rocky Mountain region. I have often been requested by correspondents to procure species which, being recorded from the 'Rocky Mountains,' were presumed to exist just outside my door, but which, as a matter of fact, were not obtainable within a hundred miles.

The striking diversity which exists, according to altitude, latitude and longitude, is worthy of attention from several points of view. To the horticulturist or botanist it suggests great possibilities of finding even conspicuous new species as new localities are explored. To the horticulturist it also strongly suggests possibilities in the way of fruit-raising, since those localities which have different wild plants are likely to be suitable for different and peculiar varieties of fruits. Valleys now uncultivated may in the future become famous for their special varieties of wine-grapes, of apples, peaches or vegetables. What has been done in Europe may be repeated here in time. Then again, to the geologist the facts are extremely significant. If the present flora of our region could be preserved in the rocks we should have a series of beds absolutely contemporaneous, yet exhibiting almost totally different sets of fossils, not merely as to species, but as to genera. The animal remains would be almost equally diverse; the insects even more so than the plants.

On August 30, 1889, I noted the more conspicuous plants observed in a short walk by Willow Creek, Custer County, Colorado, at about 8,200 feet altitude. The list is given here, and in a parallel column the nearest approximation to it obtainable in the immediate vicinity of my present home, Mesilla, New Mexico, 3,800 feet above sea level.

WILLOW CREEK, COLORADO.	MESILLA, NEW MEXICO.
Aconitum Columbianum.	Clematis ligusticifolia.
Delphinium scopulorum.	Ranunculus Cymbalaria.
Actæa spicata.	
Berberis repens.	(No Berberideæ.)
Erysimum asperum, var.	Sisymbrium, spp.
Viola Canadensis.	(No Viola.)
Silene Scouleri.	(No representative.)
Sidalcea candida.	Sphæralcea angustifolia.
Geranium Richardsoni.	(No representative.)
Lupinus argenteus, var.	Sophora sericea.
Thermopsis montana.	Dalea scoparia (with a forma nov. subrosea, flowers magenta).
Oxytropis Lamberti.	Astragalus Wootoni.
Fragaria vesca.	Prunus sp. (escaped from cultivation).
Potentilla fruticosa.	
Rosa blanda, var.	
Parnassia fimbriata.	(No representative.)
Ribes oxyacanthoides.	
Epilobium angustifolium.	Œnothera Hookeri and Œ. pallida.
Osmorrhiza nuda.	(Nothing near.)
Heracleum lanatum.	
Lonicera involucrata.	(Nothing near.)
Galium boreale.	(Nothing near.)
Aster lævis.	Aster tanacetifolius.
Aster Fremonti.	Aster canescens.
Erigeron glabellus mollis.	Erigeron divergens.
Gymnolomia multiflora.	Verbesina encelioides.
Achillea millefolium.	Lepachys Tagetes.
Rudbeckia laciniata.	Helianthus annuus.
Cnicus Parryi.	Cnicus ochrocentrus, var.
Troximon glaucum.	Pyrrhopappus, sp.
Campanula rotundifolia.	(Nothing near.)
Arctostaphylos uva-ursi.	(No Ericaceæ.)
Pyrola rotundifolia, var.	
Apocynum androsæmifolium.	Apocynum cannabinum (fide E. O. Wooton).
Gilia aggregata, var.	Gilia, sp.
Echinospermum floribundum.	Krynitzkia, sp.
Mimulus luteus.	Maurandia Wislizeni.
Castilleia integra, var.	
Orthocarpus luteus.	
Pedicularis procera.	
Polygynum aviculare.	Polygonum, spp.
Polygonum tenue.	
Polygonum convolvulus.	
Chenopodium album.	Chenopodium leptophyllum.
Comandra pallida.	Comandra pallida.
Quercus Gambelii.	(No Quercus.)
Populus tremuloides.	Populus Fremonti.
Iris Missouriensis.	(Nothing near.)
Smilacina stellata.	Yucca, spp.

Streptopus amplexifolius.	
Veratrum Californicum.	
Phleum pratense (ex. cult.).	
Juniperus communis.	Ephedra.
Picea Engelmanni.	(No Picea.)
Picea pungens.	
Pinus ponderosa scopulorum.	(No Pinus.)
Pteris aquilina.	(No Ferns.)
Equisetum arvense.	Equisetum, sp.
Equisetum hiemale.	
Marchantia polymorpha.	
Puccinia veratri.	Puccinia evadens, P. sphæralceæ.
Usnea barbata.	

I have not given very much study to the flora of Mesilla, because my friend, Professor E. O. Wooton, is working upon it, so it may be that there exist a few better representatives than I have cited. I have, however, examined the flora a good deal in my searches for insects, so it is not probable that much change would be necessary. It will readily be appreciated that if the Colorado species had been found as fossils, and another bed in New Mexico, rich in plant remains, had shown no more resemblance to the first than is here shown, geologists would have been very ready to assign different ages to the beds.

Local lists of plants, as ordinarily published, do not sufficiently bring out the differences between florulæ. In the first place, collectors will often mix up two or three florulæ in one list; in the second, in the effort to make a complete list, they will include plants which are either extremely rare or actual aliens. In these days of railroad travel, it seems common to see near railway lines, and in other places, little colonies of plants out of their proper environment, which persist a while and then perish.

I now propose to show that such differences as above indicated do not only occur between the recognized zones, but within the limits of the same zone.

In Mesilla, New Mexico, on June 18, 1897, I collected weeds in the cultivated ground of the Casad orchard. I give the list; and in a parallel column a list from the sandhills, also in Mesilla, choosing as nearly representative plants as I can. For the determinations of many of the plants I am indebted to Professor E. O. Wooton.

Cultivated Ground, Mesilla.	Sandhills, Mesilla.
Anoda hastata.	Men zelia multiflora.
Sphæralcea angustifolia.	Dithyræa Wislizenii.
Sida hederacea.	
Gaura parviflora,	Œnothera pallida
Glycyrrhiza lepidota.	
Sophora sericea.	Dalea scoparia.
Melilotus indica.	Delea lanosa
Franseria Hookeriana.	Prosopis juliflora glandulosa.
Baccharis glutinosa.	
Astera tanacetifolius.	Aster tanacetifolius.
Helianthus ci iaris.	Aster canescens.
Helianthus annuus.	Artemisia, sp.
Aster spinosus.	
Lepachys tagetes.	Lepachys Tagetes.
Flaveria repanda.	Pectis papposa.
Xanthium Canadense.	Pluchea borealis.
Erige on Canadensis.	Bigelovia Wrightii.
Verbesina encelioides.	Baileya multiradiata.
Aphanostephus ramosissimus.	Aplopappus spinulosus.
Curcubita fœtidissima.	Maurandia Wislizenii.
Ipomœa Mexicana.	Abronia turbinata.
Cuscuta (C. Californica ?).	Abronia cycloptera.
Salvia lanceolata.	Nama hispidum.
Physalis (P. lanceolata ?)	Phacelia integrifolia.
Solanum elæagnifolium.	Gilia, sp.
Portulaca oleracea or retusa.	Eriogonum, sp.
Acanthochiton Wrightii.	Acanthochiton Wrightii.
Polygonum near erectum.	Atriplex canescens.
Chenopodium leptophyllum.	Oryzopsis membranacea.
	Ephedra, sp.

The sandhill list could readily be extended by further study. The purpose just now is merely to show that two radically different floras occur in the same immediate vicinity, at the same altitude, on different kinds of soil. Cultivated lands here vary from the very sandy to the almost pure adobe, and it may be assumed that they are thus adapted for very different crops, and require different methods of cultivation.

It will be at once remarked, from the data given in this and the preceding paper, that two quite different factors have had to do with the modification of the flora. In the one case the principal factor is the climate, in the other the soil. Nevertheless, the two are intimately connected, for the soil greatly modifies the effect of the climate. Another very important factor is shade, which is present in the Colorado case. Moisture, again, is controlled partly by the general climate and partly by the

general nature of the soil—not merely the surface soil, but the underlying beds.

The professional botanist will find these notes, if new in themselves, merely illustrative of general laws long familiar to him; but they are written in the hope that others may find them interesting, and may perhaps be stimulated to make similar observations elsewhere. It is surely desirable for horticulturists to pay more attention to such matters when selecting land and choosing what to grow upon it.

T. D. A. COCKERELL.

MESILLA PARK, N. M.

CURRENT NOTES ON PHYSIOGRAPHY.

THE NIAGARA GORGE.

WHEN the gorge of Niagara was first ascribed to work of the river, it was tacitly postulated that the volume of the water and the rate of recession of the falls had been constant. This postulate gave way before the suggestion that variations in river volume may have occurred during the disappearance of the ice sheet. Now it is attempted to correlate these variations in volume on the one hand with the retreating ice front, the northeastward elevation of the land, and the temporary discharge of the upper great lakes across Ontario, and on the other hand with the breadth and depth of the gorge. A recent paper by Taylor on the 'Origin of the Gorge of the Whirlpool Rapids at Niagara' (*Bull. Geol. Soc. Amer.*, IX., 1898, 59–84) explains the narrow part of the gorge, where it is crossed by the railroad bridges and occupied by the Whirlpool Rapids, as the work of the discharge of Lake Erie alone—that discharge being called the Erie-Niagara River—while the upper lakes ran to the St. Lawrence by the Nipissing-Mattawa channel, eastward from the then expanded Georgian Bay. Before the ice sheet had retreated far enough to open this outlet the upper lakes discharged through Erie, and the large volume of Niagara at that time caused the erosion of the wider gorge and deeper gorge just below and above the Whirlpool.

It is thus implied that the channel of Detroit River must have been laid dry while the Erie-Niagara was cutting its narrow gorge, and of this Taylor has found good evidence in the depth to which the valleys of small tributaries of the Detroit are eroded below the present river surface. The manner in which many independent factors are thus correlated is really of dramatic interest.

SOUTH CAROLINA.

L. C. GLENN describes the physical features of South Carolina (*Journ. School Geogr.*, II., 1898, 9–15, 85–92), giving a clear picture of the piedmont plateau and the coastal plain. The piedmont is a peneplain gently rolling over most of the surface, but much dissected by narrow and branching side valleys near the main streams. About the headwaters many rapids and falls interrupt the streams; farther down the valleys the larger rivers have opened narrow 'bottoms,' whose fertility has been much impaired by wash from carelessly farmed hillsides. The middle and outer parts of the plateau carry a number of monadnocks, such as Ruff's, Parson's, King's and other low mountains. On the inner part of the plateau the residual mountains are higher and more numerous, rising 1,000 to 1,500 feet above the peneplain. The coastal plain is hilly along its inner border, low and smooth over most of its extent. Here the chief rivers have broad swampy flood plains. The numerous channels that divide the islands along the coast are ascribed to the strong tides of the Carolina bight.

It may be noted in this connection that the *Journal of Geography*, edited by Professor R. E. Dodge, of Teachers College, New York, has published a number of first-hand